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RESTORE Training for Restoration — The Bridge Between Theory and Practice

One of the critical preservation issues we face in the next century is the education and training of the ever increasing number of craftsworkers and design professionals who are becoming involved in the field of building restoration and preservation maintenance. For the remainder of this century and in the next, the majority of dollars spent in the construction industry in the United States will be spent on the preservation maintenance of the existing building stock. To meet the marketplace demand for building restoration, many design professionals as well as craftsworkers have entered this specialized field without the requisite training. Those who are new to the field of architectural restoration often are not familiar with new technology, materials, or procedures. Many design professionals and craftsworkers practice architectural conservation on a "learn-as-you-go," trial-and-error basis, often with disastrous and costly consequences.

The field workshop segments of the RESTORE Two-Semester Course on Masonry Conservation include demonstrations of traditional stone carving techniques.

National Needs Addressed By Training

The care and maintenance of our architectural heritage is often entrusted to individuals who, through a lack of basic knowledge and training, do not understand the properties of the materials that they are working with or how to analyze and diagnose the problems they encounter daily. As a result, they draft specifications which build in time bombs addressing the symptoms not the problems, e.g., selecting the wrong cleaning method or designing and installing an improper composite repair mix. Several universities offer full-time programs, training design and management professionals for careers in preservation. However, little attention has been given to preservation education of the man or woman on the scaffold, or to the practicing design professional. This is a serious shortcoming which has serious consequences for our architectural heritage.

It is difficult for practicing professionals and craftsworkers to acquire the necessary knowledge and skills. Few schools of architecture address these issues in their curricula. Continuing education courses for masons, bricklayers, and other craftsworkers rarely deal with the specific concerns of preservation maintenance work. Most apprenticeship programs focus on current building practice and do not provide training for work on old or historic buildings.

Craftsworker training is especially important in light of the fact that 85% of preservation maintenance projects are done by contractors working directly with the building owner or manager, without the input of a knowledgeable architect or architectural conservator. In the end, it is ultimately the work of the man or woman on the scaffold that we see; therefore, informed, competent, well trained, contractors and craftsworkers are critical to the success of a restoration or preservation maintenance project.

This is precisely the issue that RESTORE is addressing. RESTORE is a not-for-profit educational corporation which offers a broad range of innovative programs related to architectural conservation and preservation maintenance technology for people in the building industry. Founded in 1976, RESTORE is incorporated by the Board of Regents under the New York State Education Law and is a registered provider of Quality Level Three Continuing Education Units for the American Institute of Architects. RESTORE's educational programs and services include:

- Specialized Workshops on Preservation Maintenance Technology

- A comprehensive Two-Semester Course on Masonry Conservation
- Videotape series on Architectural Conservation Techniques
- Architectural Conservation Library
- Technical Clearing House for Information on Building Conservation

RESTORE's goal is to provide everyone practicing architectural preservation—from design professionals to craftworkers and cultural resource managers—with a common basis of practical knowledge in restoration technology. Everyone involved in the preservation process on the job site should look upon their work as part of a range of different teamwork skills. RESTORE is based on the premise that preservation work requires thinking craftworkers who, like the architect or preservation consultant, should be equipped to make sophisticated judgments. To be productive members of a team, all must be properly trained in state-of-the-art preservation technology. They must have a thorough understanding of the properties of materials, old and new techniques, a sound knowledge of their craft, and a basic knowledge of crafts related to their own. RESTORE has a material science approach to architectural conservation. RESTORE equips students with state-of-the-art information about the proper materials and processes used in the preservation maintenance process. The objective of RESTORE is to show the architect, engineer, contractor, and craftsworker how to think through, analyze, and resolve the problems they face daily when dealing with the maintenance and preservation of masonry structures of any vintage. Basic to this process is an understanding of the chemical and physical properties of materials and the many factors that contribute to their deterioration. RESTORE's training includes lectures, laboratory, and field-workshop demonstration sessions in six basic areas:

- Properties of Materials and Problem Analysis of Masonry Decay Processes
- Technology of Masonry Cleaning
- Technology of Masonry Repair and Replacement
- Mortar Analysis, Pointing, and Caulking
- Special Problems Related to Design and Detailing
- Health and Environmental Hazards Inherent in Restoration Materials and Processes
- Health and Environmental Hazards Inherent in Conservation Materials and Processes

Another aspect of the field that RESTORE has effectively addressed is the issue of health and environmental hazards inherent in conservation materials and processes. Today's technology is evolving so rapidly that it is often difficult for design professionals, craftsworkers, materials conservators, archeologists, and others in the field to keep abreast of new information. As a by-product of changing technology, new health and environmental hazards inherent in conservation processes are being identified and strictly regulated. A host of hazards and environmental issues affect the way we work, how we design, and how we specify, use, store, and dispose of materials. Often, irreversible or inappropriate work is done because architects, engineers, and preservation craftsworkers do not understand how to read and interpret a Material Safety Data Sheet and often try various products on a trial-and-error basis.

Participants in the RESTORE Five-Day Intensive Workshop on Masonry Conservation prepare mortar sample for chemical analysis.

Understanding the health risks posed by many restoration materials and process is essential to the safe and effective treatment of conservation problems. This is a cutting edge issue. Yet this problem is not being addressed adequately, or often not at all, by the schools that train design professionals. Indeed, RESTORE has been at the forefront of addressing this critical issue for those in the field of preservation today.

The RESTORE curricula equips one to make informed decisions about critical architectural preservation problems related to the hazards and environmental impact of the technology we specify and use today. In addition, RESTORE is publishing a *Technical Field Guide on Understanding the Health and Environmental Hazards Inherent in*

Conservation Materials and Processes which will be a focused summary of this information.

RESTORE's aim is to bring those working in the field of architectural preservation up to speed with the safe use of materials and processes that technological advances have made available. State-of-the-art conservation technology will be viable only if design professionals and craftsworkers understand and can respond to the potential hazards of the materials and processes they specify and use every day, e.g., cleaning chemicals, epoxies, adhesives, coatings, and consolidants.

To this end, RESTORE Workshops and the Technical Field Guide on Understanding the Health and Environmental Hazards Inherent in Conservation Materials and Processes provide:

- an understanding of materials and processes used in architectural preservation work and their inherent hazards;
- guidelines for evaluating and selecting the right "generic products" and preservation processes;
- methods for working safely with hazardous materials when their use is necessary;
- guidelines for the selection of proper materials and protective equipment for preservation work.

Understanding the health risks posed by many restoration materials and processes is clearly essential to achieve both safe conservation as well as effective conservation. RESTORE's training equips design professionals and craftworkers with the knowledge to make informed decisions so that they are able to design and produce safe, cost effective, and viable projects.

A craftsman explains the manufacture of cast sone to participants in the RESTORE Workshop on Architectural Replacement Materials.

RESTORE recruits a diverse faculty that enriches the curriculum with current research and case studies on architectural preservation practices. The RESTORE faculty consists of a team of nationally and internationally recognized building conservators, masonry craftsworkers, architects, engineers, chemists, geologists, and materials consultants, all of whom are actively engaged in the field of architectural restoration and preservation maintenance.

RESTORE's Programs and Services

The RESTORE Two-Semester Course on Masonry Conservation is taught in New York City and meets one evening a week, from October through May. During April and May, students participate in laboratory and field-workshop sessions. RESTORE applies a materials science approach to the preservation maintenance process. Through lectures, case studies, and field demonstrations, students gain a comprehensive understanding of the underlying properties of masonry materials, including chemical composition and physical properties, as well as decay processes. The information presented on the properties of materials and treatments is not only pertinent to the preservation of existing structures, but is also important to the design, construction, and maintenance of new structures as well.

The RESTORE curricula also includes "hands-on" laboratory sessions that focus on mortar analysis, efflorescence analysis, water absorption testing, examination, and experiments with a variety of cleaning procedures, and microscopic analysis of various coatings and consolidants for masonry. The field-workshop sessions focus on mortar analysis and mortar matching in the field, cleaning tests, and masonry repair and replacement techniques.

Since 1976, architectural and engineering firms, trade unions, mason contractors, government agencies, and preservation organizations across the United States and Canada have sponsored employees to attend RESTORE's programs. In New York alone, restoration projects overseen by RESTORE graduates include Ellis Island, Grand Central Terminal, the Smithsonian Museum of Natural History, the New York Carnegie Public Library Buildings, the New York Botanical Garden, the Brooklyn Botanic Gardens, the Brooklyn Bridge, The Empire State Building, the Chrysler Building, Carnegie Hall, and the Woolworth Building, to name a few.

RESTORE Intensive Workshops on Architectural Conservation Techniques offer an in-depth examination of specific issues relating to the latest conservation materials and methods. The

workshops are designed to travel to various parts of the country and include the annual five-day intensive course that covers all aspects of masonry conservation. Other workshops last from two to three days and can be tailored to the specific needs of any organization. The portable laboratory enables RESTORE participants to gain hands-on experience in the identification and basic analysis of materials and preservation treatments. RESTORE workshops have been sponsored by government agencies, preservation organizations, and labor and industry organizations. Workshop topics include: technology of masonry cleaning, composite repairs, mortar matching, coatings and consolidants, and the health and environmental hazards inherent in restoration materials and processes.

Additional components of RESTORE's educational programs include:

Videotape Series on Architectural Conservation Techniques. The following preservation procedures are addressed in professionally produced videos:

Architectural Replacement Materials: Cast Stone and Terra Cotta explains procedures involved in documenting existing architectural elements, discusses properties of replacement materials, demonstrates replication processes, and installation techniques.

Cleaning Masonry Structures and Guidelines for Using Consolidants and Coatings demonstrates methods for removal of paints, coatings, stains, and other soiling from masonry materials. The complex issues related to the use of coatings and chemical consolidants and their applications are also addressed.

Mortar Matching Techniques and Composite Repairs for Stone demonstrates methods for conducting mortar analyses, formulating replication mortars, and composite patching compounds.

These videos run approximately 30 minutes and illustrate step-by-step action of restoration techniques that are difficult to effectively demonstrate within the time constraints of a lecture or laboratory session.

Architectural Conservation Library. RESTORE's Library contains a select collection of books and articles on the technical study, conservation, and preservation maintenance of masonry structures and is open by appointment to people in the building industry.

Technical Clearing House. RESTORE serves as an on-line consultant, providing the building industry with current, field-tested research on critical preservation problems.

RESTORE is developing a Series of Technical Field Guides on Architectural Conservation Techniques which will address specific issues concerning the technical aspects of architectural conservation and the health and environmental hazards inherent in preservation maintenance materials and processes.

The key to architectural preservation is getting information into the hands of those who most need it, namely the design professionals and craftsworkers working in the field. This task is done most effectively through a productive dialogue between the many groups responsible for the preservation of our built environment, e.g., design professionals, preservationists, cultural resource managers, educators, public officials, and building trade unions and their members. These diverse segments of the preservation community are most effectively brought together through cooperative training and educational programs. Since 1976, RESTORE has helped to foster this spirit of collaboration, creating a unique forum which gives colleagues from related fields to learn, as well as the opportunity to share their knowledge and experience.

For all of us entrusted with the preservation of our cultural and architectural heritage, there is a fundamental need for further education about the technology of architectural conservation and the inherent hazards of the processes and materials used in this field. Clearly, craftsworkers and design professionals who are trained and are knowledgeable about preservation materials and processes are equipped to make knowledgeable decisions and to avoid hazardous situations which are costly for the project and cause irreversible damage to our cultural heritage, to the health of craftsworkers, to the public, and to the environment. Education is key to understanding the risks posed by many restoration materials and processes and to achieve both safe conservation, as well as good conservation practice. RESTORE's training fosters professional excellence and addresses key preservation issues of national significance for craftworkers and design professionals alike. The end result is that people benefit, the environment benefits, and ultimately our architectural heritage benefits.

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Photos courtesy the author.